



Indiana Health Alert Network Notification – July 24, 2018

UPDATE: Epidemiology, Diagnosis, and Management of Tick-borne Diseases in Indiana

In 2017, the Indiana State Department of Health (ISDH) reported more than 250 cases of tick-borne disease, including a pediatric fatality due to Rocky Mountain spotted fever. More than 100 cases of tick-borne disease have already been reported in 2018, including a death due to ehrlichiosis in an elderly patient. Cases of tick-borne disease in Indiana typically peak in July and continue into the late summer and early fall months. This advisory provides information on the clinical presentation, diagnosis, and treatment of common tick-borne diseases in Indiana, along with some additional recommendations. This advisory also contains updated information on emerging tick-borne diseases.

UPDATE: Emerging Tick-borne Diseases

Heartland virus and Bourbon virus are two emerging viruses thought to be transmitted by the bite of infected ticks. Indiana has reported a total of two cases of Heartland virus in southern Indiana (one in 2015 and one in 2017) and has reported no cases of Bourbon virus. Patients with Heartland virus or Bourbon virus infections present with symptoms typical of other tick-borne illnesses, including fever, fatigue, decreased appetite, headache, nausea, diarrhea, and muscle and joint aches. Most patients also have leukopenia and/or thrombocytopenia that is not explained by another known condition.

Testing for Heartland virus and Bourbon virus may be considered in patients with a suspected tick-borne disease (e.g., ehrlichiosis, Rocky Mountain spotted fever) who do not respond to treatment with doxycycline. The Centers for Disease Control and Prevention (CDC) now offers diagnostic testing for Heartland virus and Bourbon virus. Patients must have clinically compatible illness, and specimens must be approved by the ISDH to be tested for these viruses. Please call Taryn Stevens, Zoonotic and Vector-borne Epidemiologist, at 317-234-9727 to arrange testing.

Epidemiology

The most common tick-borne diseases reported in Indiana are Lyme disease, Rocky Mountain spotted fever, and ehrlichiosis. Cases have been reported year-round, although most cases are reported during the spring and summer months. Ticks that can transmit disease are present throughout the state of Indiana. The distribution of tick-borne diseases varies geographically in the state, with increased prevalence of Lyme disease in northwest Indiana and increased prevalence of Rocky Mountain spotted fever and ehrlichiosis in southern Indiana. However, health care providers are encouraged to consider tick-borne disease in patients throughout the state.

Obtaining a thorough clinical history that includes questions about recent tick exposure, recreational or occupational exposure to tick habitats, and travel to areas where tick-borne diseases are endemic can provide critical information to make a presumptive diagnosis of tick-borne illness. However, the absence of one or more of these factors does not exclude a diagnosis of tick-borne disease. Absence of a reported tick bite is common and has been associated with delays in treatment. Activities such as playing in a backyard, visiting a park, and gardening should be considered to be potential tick exposures.

Clinical presentation

Many cases of tick-borne disease begin with non-specific flu-like symptoms, including fever, headache, chills, and myalgia. The table below lists signs and symptoms commonly seen with tick-borne diseases in Indiana. However, it is important to note that few people will develop all signs and symptoms, and the number and combination of symptoms varies greatly from person to person. **Due to the life-threatening nature of these infections, treatment should always be initiated upon first suspicion of ehrlichiosis or Rocky Mountain spotted fever.**

| Condition | Incubation Period | Signs and Symptoms | Cutaneous Signs | Laboratory Findings |
|---|-------------------|--|--|--|
| Ehrlichiosis <i>Ehrlichia chaffeensis</i> <i>Ehrlichia ewingii</i> | 1 – 2 weeks | <ul style="list-style-type: none"> • Fever • Headache • Chills • Malaise • Muscle pain • Nausea • Vomiting • Diarrhea • Confusion | <ul style="list-style-type: none"> • Rash – More commonly reported in children | <ul style="list-style-type: none"> • Thrombocytopenia • Leukopenia • Anemia • Mild to moderate elevations in hepatic transaminases |
| Lyme disease <i>Borrelia burgdorferi</i> | 3 – 30 days | <ul style="list-style-type: none"> • Malaise • Headache • Fever • Myalgia • Arthralgia • Lymphadenopathy • Transient arthritis and effusion in one or multiple joints • Cardiac and neurologic manifestations | <ul style="list-style-type: none"> • Erythema migrans (EM) – red ring-like or homogenous expanding rash • Not present in all cases | <ul style="list-style-type: none"> • Elevated erythrocyte sedimentation rate • Mildly elevated hepatic transaminases • Microscopic hematuria or proteinuria |
| Rocky Mountain spotted fever <i>Rickettsia rickettsii</i> | 2 – 14 days | <ul style="list-style-type: none"> • Fever • Chills • Severe headache • Malaise • Myalgia • Nausea • Vomiting • Anorexia • Abdominal pain • Diarrhea • Photophobia • Focal neurologic deficits | <ul style="list-style-type: none"> • Maculopapular rash – initially appears on the wrists, forearms, and ankles and spreads to trunk. Not present in all cases. • Petechial rash – considered a sign of progression to severe disease. | <ul style="list-style-type: none"> • Thrombocytopenia • Mildly elevated hepatic transaminase levels • Hyponatremia |

Diagnosis

The diagnosis of ehrlichiosis and Rocky Mountain spotted fever must be made based on clinical signs and symptoms, and can later be confirmed using laboratory tests. **Treatment should never be delayed pending the receipt of laboratory test results, or be withheld on the basis of initial negative findings.** For information on diagnostic tests for Lyme disease and other tick-borne illnesses, please refer to the [Tick-borne Diseases of the United States Reference Manual for Health Care Providers](#).

Treatment

Doxycycline is the first line of treatment for adults and children of all ages with suspected ehrlichiosis or Rocky Mountain spotted fever and should be initiated immediately upon suspicion of illness. The use of doxycycline to treat suspected tick-borne illness in children is standard practice recommended by both the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) Committee on Infectious Diseases. Unlike older tetracyclines, the recommended dose and duration of doxycycline needed to treat tick-borne illness has not been shown to cause staining of permanent teeth. Treatment is most effective at preventing death from Rocky Mountain spotted fever if doxycycline is started in the first five days of symptoms. For information on treatment of Lyme disease and other tick-borne illnesses, please refer to the [Tick-borne Diseases of the United States Reference Manual for Health Care Providers](#).

Recommendations

- Health care providers should ask about outdoor exposure in the history, including location and dates of exposure.
- Health care providers should still consider tick-borne diseases in the differential even if other diagnoses are identified.
- Health care providers should not rule out tick-borne disease if there was no recognized tick exposure.
- Health care providers should use doxycycline as the first-line treatment for suspected ehrlichiosis and Rocky Mountain spotted fever in patients of all ages.
- Tick-borne diseases are reportable within 72 hours to the local health department of the county where the patient resides (410 IAC 1-2.5-75).

For more information

- Tick-borne Diseases of the United States: A reference manual for healthcare providers: <https://www.cdc.gov/ticks/tickbornediseases/index.html>
- Diagnosis and Management of Tick-borne Rickettsial Diseases: Rocky Mountain Spotted Fever and Other Spotted Fever Group Rickettsioses, Ehrlichioses, and Anaplasmosis – United States, A Practical Guide for Health Care and Public Health Professionals: https://www.cdc.gov/mmwr/volumes/65/rr/rr6502a1.htm?s_cid=rr6502a1_w
- Lyme disease — Health Care Providers: <https://www.cdc.gov/lyme/healthcare/index.html>
- Rocky Mountain spotted fever (RMSF) — Health Care Providers: <https://www.cdc.gov/rmsf/healthcare-providers/index.html>
- Indiana Communicable Disease Rule: http://www.in.gov/isdh/files/Final_Rule_LSA_.pdf

For questions, please contact Taryn Stevens, Zoonotic and Vector-Borne Epidemiologist, at tastevens@isdh.in.gov or 317-234-9727.